

Measures and Data Sources for Environmental Public Health Indicators

Topic: Air, Ambient (Outdoor)

<i>Indicator by Type (and tier)</i>	<i>Suggested Measure (by tier)</i>	<i>Potential Data Source</i>
Hazards		
Criteria pollutants in ambient air (<i>core</i>)	1) Annual high levels of criteria pollutants: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO ₂), ozone (O ₃), PM ₁₀ , sulfur dioxide (SO ₂) (<i>core</i>) 2) Tons of criteria pollutants released in ambient air (<i>core</i>)	EPA: National Air Quality and Emissions Trends Report; NMMAPS, NTI; NEI; Urban Air Toxics Program; TRI/EPCRA; AIRS States or local jurisdictions: environmental protection agencies, especially those with indicator projects; Urban Air Toxics Programs
Hazardous or toxic substances in ambient air (<i>core</i>)	1) Tons of one or more hazardous or toxic substances released in ambient air (<i>core</i>) 2) Number of reports of noncompliance for emissions releases (<i>developmental</i>)	ATSDR: HSEES EPA: National Air Quality and Emissions Trends Report; NMMAPS, NTI; NEI; TRI/EPCRA; AIRS NOAA (NWS) States or local jurisdictions: environmental protection agencies, especially those with indicator projects; Urban Air Toxics Programs
Motor vehicle emissions (<i>core</i>)	1) Vehicle miles driven per capita (<i>core</i>) 2) Average fuel efficiency of registered motor vehicles (<i>optional</i>)	CB: census data DOE (EIA) DOT, FHA: NPTS
Residence in non-attainment areas (<i>core</i>)	1) Percentage of human population residing in non-attainment areas (for criteria air pollutants) (<i>core</i>)	CB: census data EPA: National Air Quality and Emissions Trends Report, NMMAPS
Exposures		
(None identified)		
Health Effects		
Unusual pattern of asthma events (<i>core</i>)	1) Number of asthma-related deaths (<i>core</i>) 2) Incidence of asthma (<i>core</i>) 3) Rates of hospitalization and emergency department visits for acute asthma events (<i>core</i>) 4) Number of work days missed because of asthma (<i>optional</i>) 5) Number of school days missed because of asthma (<i>optional</i>) 6) Proportion of population filling prescriptions for asthma medication (<i>developmental</i>)	CDC: NHAMCS, NHDS, NVSS States or local jurisdictions: CDI surveillance; ME/Cs; vital statistics
Unusual pattern of cardiovascular or respiratory events (<i>core</i>)	1) Incidence of cardiovascular and respiratory events (<i>core</i>) 2) Rates of hospitalization and emergency department visits for acute cardiovascular and respiratory events (<i>core</i>)	CDC: NHAMCS, NHDS, NVSS States or local jurisdictions: CDI surveillance; vital statistics

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<i>Indicator by Type (and tier)</i>	<i>Suggested Measure (by tier)</i>	<i>Potential Data Source</i>
Interventions		
Programs that address motor vehicle emissions (<i>core</i>)	1) Proportion of population residing in jurisdictions that have vehicle emissions mandates (<i>core</i>) 2) Number of public education messages to encourage the use of personal transportation alternatives (e.g., (“ozone action day”)) (<i>optional</i>)	CB: census data DOT (FHA): NPTS States or local jurisdictions: environmental protection and transportation agencies, especially those with indicator projects
Alternate fuel use in registered motor vehicles (<i>core</i>)	1) Proportion of registered vehicles powered by alternative fuel (<i>core</i>)	DOE (EIA) States or local jurisdictions: transportation agencies
Availability of mass transit (<i>core</i>)	1) Proportion of population for whom mass transit is available (<i>core</i>) 2) Proportion of population who chose personal transportation alternatives (e.g., walking, bicycling) (<i>optional</i>)	CB: census data CDC: BRFSS; NHIS DOT (FHA): National Bicycle and Walking Study; NPTS States or local jurisdictions: CDI surveillance; transportation agencies
Programs that address hazardous or toxic substances in ambient air (<i>optional</i>)	1) Number of jurisdictions that have air toxics monitoring programs (<i>optional</i>) 2) Number of operating permits for releases of hazardous air pollutants (<i>optional</i>) 3) Number of fines for hazardous releases violations (<i>optional</i>)	EPA States or local jurisdictions: environmental protection agencies

Measures and Data Sources for Environmental Public Health Indicators

Topic: Air, Indoor

<i>Indicator by Type (and tier)</i>	<i>Suggested Measure (by tier)</i>	<i>Potential Data Source</i>
Hazards		
Tobacco smoke in homes with children (<i>core</i>)	1) Proportion of children residing in households with adult smokers (<i>core</i>) 2) Proportion of households with adult smokers (<i>core</i>) 3) Proportion of children who smoke (<i>optional</i>)	CB: census data CDC: BRFSS; NHIS; YRBSS EPA Legacy Foundation States or local jurisdictions: CDI surveillance; environmental protection agencies, especially those with indicator projects
Hazardous or toxic substances in indoor air (<i>optional</i>)	1) Proportion of houses with group I dust mite in beds (<i>optional</i>) 2) Proportion of houses with >0.1 unit/g German cockroach dust in beds (<i>optional</i>) 3) Proportion of schools with indoor air hazards (<i>developmental</i>)	CDC HUD: National Survey of Lead and Allergens in Housing NIEHS
Exposures		
(None identified)		
Health Effects		
CO poisoning (not fire - related) (<i>core</i>)	1) Number of deaths from CO poisoning (<i>core</i>) 2) Number of hospitalizations and emergency department visits attributed to CO exposure (<i>core</i>)	CDC: NHAMCS; NHDS; NVSS States or local jurisdictions: injury and CDI surveillance; hospital discharge data; ME/Cs; vital statistics
Unusual pattern of respiratory events (<i>optional</i>)	1) Number of emergency department visits in which an air-borne agent is suspected (<i>optional</i>) 2) Number of deaths in which an air-borne agent is suspected (<i>optional</i>)	CDC: NHAMCS; NHDS; NVSS States or local jurisdictions: CDI surveillance; ME/Cs; vital statistics
Interventions		
Policies that address indoor air hazards in schools (<i>core</i>)	1) Proportion of schools with indoor air policies (<i>core</i>) 2) Proportion of schools with smoke-free and tobacco-free policies (<i>core</i>)	CDC: NHIS; SHPPS; YRBSS EPA States or local jurisdictions: CDI surveillance; STATE
Laws pertaining to smoke-free indoor air (<i>core</i>)	1) Number of jurisdictions with laws on smoke-free indoor air (<i>core</i>) 2) Proportion of resident population in jurisdictions with laws pertaining to smoke-free indoor air (<i>core</i>)	CB: census data CDC, NIOSH States or local jurisdictions: STATE; health agencies, occupational safety and health divisions
Indoor air inspections (<i>core</i>)	1) Number of complaint-related indoor air inspections (<i>core</i>)	CDC (NIOSH) OSHA
Use of best practices for protecting indoor air (<i>optional</i>)	1) Number of local jurisdictions with ordinances requiring CO detectors in apartment buildings (<i>optional</i>) 2) Proportion of non-manufacturing work force that occupies office buildings for which indoor air quality management practices address human health (<i>optional</i>) 3) Proportion of resident population for which programs are available for testing radon in high-risk homes (<i>optional</i>)	CDC: NHIS, NIOSH surveillance systems EPA OSHA: health agencies, occupational safety and health divisions States or local jurisdictions: health agencies, occupational safety and health divisions; local OSHA; STATE

Measures and Data Sources for Environmental Public Health Indicators

Topic: Disasters

<i>Indicator by Type (and tier)</i>	<i>Suggested Measure (by tier)</i>	<i>Potential Data Source</i>
Hazards		
Residence in a flood plain (core)	1) Proportion of resident population with homes in a flood plain (core)	CB: census data FEMA USGS
Geographic or climatic conditions that increase susceptibility to hazards (optional)	1) Number of days in which temperatures exceed safe thresholds (optional) 2) Amount of excessive rainfall (optional) 3) Duration of drought conditions (developmental) 4) Number of days of flooding (developmental) 5) Number of floods in areas with high concentrations of pesticide through production, sales, or use (developmental)	FEMA NOAA USDA USGS States or local jurisdictions: agriculture and environmental protection agencies, especially those with indicator projects
Residence in a temporary or unsafe structure (optional)	1) Proportion of population residing in damaged or destroyed home (optional) 2) Proportion of population residing in temporary shelter (optional)	ARC CB: census data CDC FEMA States or local jurisdictions
Exposures		
(None identified)		
Health Effects		
Deaths attributed to extremes in ambient temperature (core)	1) Number of heat-attributed deaths (core) 2) Number of deaths from hypothermia (optional)	ARC CDC: NHAMCS; NHDS; NVSS EPA: NMMAPS NOAA (NWS, NCDC, NSSL): States or local jurisdictions: ME/Cs; vital statistics
Morbidity and mortality attributed to natural forces (optional)	1) Number of illnesses or injuries from natural disasters by type of disaster (optional) 2) Number of deaths from natural disasters by type of disaster (optional)	ARC CDC: NHAMCS; NHDS; NVSS EPA: NMMAPS NOAA (NWS, NCDC, NSSL) States or local jurisdictions: ME/Cs; vital statistics
Intervention		
Emergency preparedness, response, and mitigation training programs, plans, and protocols (core)	1) Proportion of jurisdictions for which multi-institutional exercises to prepare for disaster response are conducted annually (core) 2) Proportion of jurisdictions for which there protocols exist for public education messages to elicit preventive behaviors among resident population (optional) 3) Proportion of jurisdictions for which early warning systems are in place (optional) 4) Proportion of jurisdictions for which sheltering programs exist (optional) 5) Proportion of jurisdictions for which safe building codes are enforced (optional)	CDC (NCEH) FEMA NOAA (NWS, NCDC, NSSL) States or local jurisdictions: health and public safety agencies; local FEMA

Measures and Data Sources for Environmental Public Health Indicators

Topic: Lead

<i>Indicator by Type (and tier)</i>	<i>Suggested Measure (by tier)</i>	<i>Potential Data Source</i>
Hazards		
Lead contamination in the environment (<i>optional</i>)	1) Proportion of housing stock built before 1950 (<i>optional</i>) 2) Lead levels in sediment and in game or commercial fish (<i>optional</i>)	CB HUD States or local jurisdictions: environmental protection agencies, especially those with indicator projects
Residence near metal processing industries (<i>developmental</i>)	1) Proportion of population residing near lead smelters (<i>developmental</i>)	CB HUD
Exposure		
Blood lead level (in children) (<i>core</i>)	1) Proportion of high-risk children with elevated blood lead level (<i>core</i>)	CDC: NHANES; Lead Surveillance Program States or local jurisdictions: prevalence surveys
Health Effect		
Lead poisoning (in children) (<i>core</i>)	1) Number of hospitalizations from lead poisoning in children (<i>core</i>)	CDC: NHAMCS; NHDS States or local jurisdictions: hospital discharge surveys
Intervention		
Lead elimination programs (<i>optional</i>)	1) Number of jurisdictions with lead training and certification programs (<i>optional</i>) 2) Proportion of population living in pre-1950 housing that has been tested for the presence of lead-based paint (<i>optional</i>) 3) Number of completed lead abatements (<i>developmental</i>)	CB CDC: NHIS EPA HUD States or local jurisdictions Private sector: industry monitoring systems

Measures and Data Sources for Environmental Public Health Indicators

Topic: Noise

<i>Indicator by Type (and tier)</i>	<i>Suggested Measure (by tier)</i>	<i>Potential Data Source</i>
Hazard		
Residence in noisy environments (<i>optional</i>)	1) Number of noise complaints (<i>optional</i>) 2) Level of noise monitored in a community (<i>optional</i>)	States or local jurisdictions: police, sheriff offices
Exposures		
(None identified)		
Health Effect		
Noise-induced hearing loss (non-occupational) (<i>core</i>)	1) Proportion of noise-exposed adults with hearing loss (<i>core</i>) 2) Proportion of children and adolescents with hearing loss (<i>optional</i>)	CDC: BRFSS; NHANES; NHIS; YRBS DOD (Recruiting Offices) States or local jurisdictions: prevalence surveys from health agencies, schools
Intervention		
Hearing protection practices (<i>optional</i>)	1) Proportion of population using appropriate ear protection devices and equipment (<i>optional</i>) 2) Number of jurisdictions with noise ordinances and prohibitions on specific activities (<i>optional</i>)	CDC: NHIS OSHA

Measures and Data Sources for Environmental Public Health Indicators

Topic: Pesticides

<i>Indicator by Type (and tier)</i>	<i>Suggested Measure (by tier)</i>	<i>Potential Data Source</i>
Hazards		
Pesticide use and patterns of use (<i>core</i>)	1) Annual tons used (<i>core</i>) 2) Pounds applied (<i>core</i>) 3) Patterns of use in agriculture, home, and garden (<i>optional</i>) 4) Number of worker and community complaints about possible pesticide exposure (<i>developmental</i>)	EPA (OPP, Health Effects Division) USDA (PDP): USGS (NAWQA, NASQAN) States or local jurisdictions: monitoring and reporting systems; environmental protection agencies, especially those with indicator projects; local USGS Offices
Residual pesticide in foods (<i>core</i>)	1) Proportion of foods with residual pesticide levels that fail to meet safe consumption regulations and guidelines (<i>core</i>)	EPA USDA (FDA): Total Dietary Survey
Exposure		
Biologic markers of pesticides or pesticide metabolites in human tissue (<i>optional</i>)	1) 95 th percentile blood and urine concentration levels for biomarkers of exposure to carbaryl (1-naphthol), methyl parathion and parathion (paranitrophenol), chlorpyrifos (3,5,6-trichloro-2-pyridinol), propoxur (isopropoxyphenol), 2,4-D, o-phenylphenol, permethrins, diazinon, chlordane, dieldrin, DDT, lindane (<i>optional</i>) 2) 95 th percentile urine concentration level for six biomarkers of exposure to 28 pesticides: dimethyl phosphate, dimethyl thiophosphate, dimethyl dithiophosphate, diethyl phosphate, diethyl thiophosphate, diethyl dithiophosphate (<i>optional</i>)	CDC: NHANES; NRHEEC States or local jurisdictions: survey data from human exposure capacity-building projects
Health Effect		
Pesticide-related poisoning and illness (<i>core</i>)	1) Incidence of pesticide-related poisonings and illnesses in pesticide workers (<i>core</i>) 2) Number of non-occupational pesticide-related poisoning and illness (<i>core</i>) 3) Number of pesticide-related poisoning and illness in children (<i>core</i>)	AAPCC: TESS CDC: NHDS; SENSOR/NIOSH surveillance systems; NVSS; terrorism surveillance States or local jurisdictions: injury indicators surveillance; ME/Cs; pesticide poisoning surveillance programs; terrorism surveillance

Measures and Data Sources for Environmental Public Health Indicators

Topic: Pesticides

<i>Indicator by Type (and tier)</i>	<i>Suggested Measure (by tier)</i>	<i>Potential Data Source</i>
Interventions		
Compliance with pesticide application standards (<i>core</i>)	1) Proportion of workers, handlers, and trainers in compliance with employee training standards (<i>core</i>) 2) Proportion of workers in compliance with recommendations for home and yard use (<i>developmental</i>)	CDC: NHIS EPA OSHA USDA States or local jurisdictions: pesticide programs within agriculture, environment, and health agencies
Public and professional education (<i>optional</i>)	1) Public awareness campaigns about pesticide hazards and safe application and use (<i>optional</i>) 2) Public and professional education about symptoms of low-level pesticide exposure (<i>optional</i>)	EPA OSHA USDA States or local jurisdictions: pesticide programs in agriculture, environment, and health agencies
Alternatives to pesticide use (<i>developmental</i>)	1) Number of jurisdictions in which “organic” foods are available (<i>developmental</i>) 2) Consumption patterns of “organically grown” foods (<i>developmental</i>)	EPA OSHA USDA States or local jurisdictions: pesticide programs in agriculture, health, and environmental agencies, especially those with indicator projects

Measures and Data Sources for Environmental Public Health Indicators

Topic: Sentinel Events

<i>Indicator by Type (and tier)</i>	<i>Suggested Measure (by tier)</i>	<i>Potential Data Source</i>
Hazard		
Unsafe or unhealthy environmental event or condition (<i>optional</i>)	1) Chemical spill (<i>core</i>) 2) Ambient ozone concentration that exceeds the safe level (<i>optional</i>) 3) Ambient temperature that exceeds safe threshold (<i>optional</i>) 4) Disaster (e.g., natural, sociopolitical) (<i>optional</i>)	ATSDR DOT EPA NOAA, NWS States or local jurisdictions: environmental protection agencies, especially those with indicator projects USGS
Exposures		
(None identified)		
Health Effects		
Illness or condition with suspected or confirmed environmental exposure (<i>core</i>)	1) Asthma-related death (<i>core</i>) 2) Case of methemoglobinemia (<i>core</i>) 3) Illness attributed to ambient or drinking water contaminants (<i>core</i>) 4) CO poisoning (not fire-related) (<i>core</i>) 5) Hospitalization from lead poisoning in a child (<i>core</i>) 6) Consultation or emergency department visit for possible poisoning in a child, including lead poisoning (<i>core</i>) 7) Pesticide-related poisoning or illness (<i>core</i>) 8) Temperature-attributed death (<i>core</i>) 9) Food-borne illness (<i>optional</i>)	AAPCC: TESS CDC: BRFSS; Food Net; Pulse Net; NHAMCS; NHDS; NHIS; NVSS CDC, ARC EPA: NMMAPS HCFA: Medicare; Medicaid NOAA (NCDC; NWS; NSSL) States or local jurisdictions: asthma, CDI and injury indicator surveillance; ambulatory care and hospital discharge data; ME/Cs; vital statistics Private sector: HMOs, medical insurers
Unusual pattern of illness or condition with suspected or confirmed environmental contribution (<i>core</i>)	1) Rates of acute asthma events (<i>core</i>) 2) Rates of cardiovascular and respiratory events in persons with underlying disease on days when outdoor air standards are exceeded or when temperatures are at dangerous levels (<i>core</i>) 3) Cancer incidence and mortality rates, specifically lung cancer in non-smokers, mesothelioma, soft tissue sarcoma, and melanoma (<i>optional</i>) 4) Incidence rates for adverse reproductive outcomes, specifically low and very low birth weight and pre-term and very pre-term births (<i>optional</i>) 5) Incidence rates of developmental disabilities, specifically mental retardation and autism spectrum disorder (<i>optional</i>) 6) Incidence rates of birth defects, especially cerebral palsy (<i>optional</i>) 7) Syndromes with unknown etiologies that require emergency medical care or cause death (<i>developmental</i>)	CDC: MACDP; MADDSP; NBDPN; NVSS HCFA: Medicare; Medicaid States or local jurisdictions: asthma surveillance programs; cancer registries; CDI surveillance; hospital discharge surveys; ME/Cs; vital statistics Private sector: HMOs, medical insurance companies; health care databases, especially emergency department visits
Intervention		
Use of surveillance and warning system (<i>optional</i>)	1) Number of surveillance systems for sentinel events, syndromes, and unusual patterns of disease that include environmental data (<i>optional</i>) 2) Number of vector-control programs that use environmental data (<i>optional</i>)	CDC States or local jurisdictions: health, environmental protection, and natural resources agencies

Source: Environmental Public Health Indicators Project, CDC, NCEH, EHHE, December 2003

Measures and Data Sources for Environmental Public Health Indicators

Topic: Sun and Ultraviolet Light

<i>Indicator by Type (and tier)</i>	<i>Suggested Measure (by tier)</i>	<i>Potential Data Source</i>
Hazard		
Ultraviolet (UV) light (core)	1) Number of days in which the UV light index exceeds a safe threshold (core)	EPA NOAA (NWS) States or local jurisdictions: environmental protection agencies, especially those with indicator projects
Exposures		
(None identified)		
Health Effects		
Melanoma (core)	1) Incidence of melanoma (core) 2) Melanoma mortality (core)	CDC: NHDS, NVSS States or local jurisdictions: cancer registries; CDI surveillance hospital discharge surveys; vital statistics
Injuries attributed to UV light (optional)	1) Number of corneal burns (optional) 2) Number of other eye injuries (optional) 3) Incidence of cataracts (optional)	CDC: NHAMCS, NHDS
Intervention		
Public education (optional)	1) Proportion of adults who follow protective measures to prevent melanoma and skin cancer (optional) 2) Proportion of adolescents who follow protective measures to prevent melanoma and skin cancer (optional) 3) Number and type of sun protection messages issued to the public (optional) 4) Number of purchases of sun blocking products (developmental)	CDC: NHIS NWS States or local jurisdictions: health agencies Private sector: marketing agencies

Measures and Data Sources for Environmental Public Health Indicators

Topic: Toxics and Waste

<i>Indicator by Type (and tier)</i>	<i>Suggested Measure (by tier)</i>	<i>Potential Data Source</i>
Hazards		
Chemical spills (<i>core</i>)	1) Number of chemical spills by type and location (<i>core</i>)	ASDR: HSEES DOT EPA States or local jurisdictions: environment, transportation, and agriculture agencies
Toxic contaminants in foods (<i>core</i>)	1) Levels of toxic contaminants in foods (<i>core</i>)	USDA (FDA): Total Diet Survey
Hazardous waste sites (<i>optional</i>)	1) Proportion of leaking underground storage facilities that have not been remediated (<i>optional</i>) 2) Proportion of identified Brownfield properties that have not been remediated (<i>optional</i>) 3) Tons of toxic substances and materials sold to general public (<i>optional</i>) 4) Proportion of population in close proximity to leaking underground storage facilities, Brownfield properties, and sites on the National Priority List and RCRA lists (<i>optional</i>) 5) Number of worker and community complaints about possible toxic exposures (<i>developmental</i>)	ATSDR CDC, NIOSH DOC EPA OSHA States or local jurisdictions: agriculture and environmental protection agencies, especially those with indicator projects
Exposures		
Biologic markers of human exposure to heavy metals (<i>optional</i>)	1) Blood and urine concentration level (95 th percentile) for lead, arsenic, cadmium, manganese, mercury (<i>optional</i>)	CDC: ABLES; NHANES; NRHEEC States or local jurisdictions: lead prevalence surveys
Biologic markers of human exposure to persistent chemicals (<i>optional</i>)	1) Serum concentration level (95 th percentile) for polychlorinated biphenyls (PCB), dioxins, furans (<i>optional</i>)	CDC: ABLES; NHANES; NRHEEC
Health Effects		
Possible child poisoning (<i>core</i>)	1) Consultations for child poisoning (<i>core</i>) 2) Emergency department visit for child poisoning (<i>core</i>)	AAPCC: TESS CDC: NHAMCS; NHDS; NVSS CPSC States or local jurisdictions: injury indicators surveillance; ME/Cs; vital statistics
Morbidity and mortality associated with toxic substances (<i>optional</i>)	1) Number of non-occupational poisonings (<i>optional</i>) 2) Number of deaths from non-occupational poisoning (<i>optional</i>) 3) Number of injuries resulting from chemical spills (<i>optional</i>)	AAPCC: TESS CDC: NHAMCS; NHDS; NVSS; NEISS; NIOSH CPSC States or local jurisdictions: CDI and injury indicators surveillance; health agencies, occupational health and safety divisions; ME/Cs; vital statistics

Measures and Data Sources for Environmental Public Health Indicators

Topic: Toxics and Waste

<i>Indicator by Type (and tier)</i>	<i>Suggested Measure (by tier)</i>	<i>Potential Data Source</i>
Interventions		
Use of surveillance and warning systems (optional)	1) Number of jurisdictions that have surveillance systems for detecting methemoglobinemia and acute poisoning from lead, arsenic, cadmium, mercury, pesticides, and other chemicals (optional) 2) Number of fish consumption advisories (optional)	States or local jurisdictions: health, environmental protection, and natural resources agencies
Waste and toxic substances reduction (optional)	1) Proportion of solid waste diverted from disposal (optional) 2) Identified sites with completed exposure pathways (optional)	CDC: NHIS EPA States or local jurisdictions: health, environmental protection, and natural resources agencies
Public education (developmental)	1) Public awareness campaigns about toxic and hazardous household products (developmental) 2) Number of purchases of home safety and child-proofing devices (e.g., electrical outlet covers, cabinet locks, smoke detectors) (developmental)	Private sector: marketing agencies; solid waste disposal companies

Measures and Data Sources for Environmental Public Health Indicators

Topic: Water, Ambient

<i>Indicator by Type (and tier)</i>	<i>Suggested Measure (by tier)</i>	<i>Potential Data Source</i>
Hazards		
Monitored contaminants in ambient water (<i>core</i>)	1) Levels of contaminants monitored under CWA and state regulations and guidelines by type of water body (e.g., surface, recreational, marine) (<i>core</i>) 2) Proportion of marine and freshwater recreational waters that fail to meet water quality regulations and guidelines (<i>core</i>) 3) Proportion of treated recreational waters that fail to meet state and local standards for free chlorine levels by type of recreational water (swimming pools, water parks, play fountains) (<i>core</i>) 4) Number of health-related closure days for marine and freshwater recreational areas (<i>optional</i>) 5) Land-use patterns (<i>developmental</i>)	EPA: BEACH Program; CWA compliance data USDA USGS (NAWQA) States or local jurisdictions: public drinking water utilities; environmental protection and natural resources agencies; pool inspection program
Point-source discharges into ambient water (<i>core</i>)	1) Volume of point-source discharges by type of contaminant (permitted sanitary waste disposal, sewage overflows, unintentional discharges and spills) (<i>core</i>) 2) Levels of mercury, dioxin, PCB, other in recreational (fishing) water bodies (<i>developmental</i>)	EPA: BEACH program FDA
Contaminants in shellfish and sport and commercial fish (<i>core</i>)	1) Levels of fecal coliform and mercury in shellfish beds (<i>core</i>) 2) Levels of mercury, dioxin, and PCB in sport and commercial fish (<i>core</i>)	FDA States or local jurisdictions: shellfish and food safety programs in health and natural resources agencies
Exposures		
(None identified)		
Health Effects		
Outbreaks attributed to fish and shellfish consumption (<i>core</i>)	1) Number of outbreaks by source (fish, shellfish) and etiologic agent (biologic, toxic, other) (<i>core</i>)	CDC States or local jurisdictions: health agencies
Outbreaks attributed to ambient water contaminants (<i>core</i>)	1) Number of outbreaks by source (freshwater, marine, treated recreational water) and etiologic agent (biologic, toxic, other) (<i>core</i>)	CDC States or local jurisdictions: health agencies
Interventions		
Activity restrictions (<i>core</i>)	1) Number and type of health-based activity restrictions (<i>core</i>)	EPA: BEACH Program FDA States or local jurisdictions: shellfish and food safety programs in health, environmental protection, and natural resources agencies, especially those with indicator projects
Compliance with regulations and guidelines (<i>optional</i>)	1) Number of fines for noncompliance with CWA regulations or local guidelines (<i>optional</i>)	EPA
Public education (<i>optional</i>)	1) Public awareness campaigns about health hazards associated with on-lot wastewater treatment systems (<i>optional</i>)	States or local jurisdictions: health and environment agencies

Source: Environmental Public Health Indicators Project, CDC, NCEH, EHHE, December 2003

Measures and Data Sources for Environmental Public Health Indicators

Topic: Water, Drinking

<i>Indicator by Type (and tier)</i>	<i>Suggested Measure (by tier)</i>	<i>Potential Data Source</i>
Hazards		
Monitored contaminants in drinking water (<i>core</i>)	1) Number and proportion of drinking water systems that fail to meet water quality regulations and guidelines (SDWA MCLs, CCLs, state lists) by type of water supply (<i>core</i>) 2) Measurements of SDWA MCLs, CCLs, and contaminants monitored under state regulations and guidelines by type of water supply (<i>core</i>) 3) Number of citations for noncompliance with local standards for free chlorine levels (<i>optional</i>)	AWWA EPA: CWA, SDWIS States or local jurisdictions: environmental protection agencies, especially those with indicator projects; Consumer Confidence Reports from local water utilities
Source water contamination (<i>optional</i>)	1) Number and type of point-source discharges into drinking water aquifers (<i>optional</i>) 2) Levels of naturally occurring toxicants (<i>optional</i>) 3) Levels and types of contamination of private water supplies (<i>developmental</i>)	EPA USGS States or local jurisdictions: environmental protection agencies, especially those with indicator projects
Exposures		
(None identified)		
Health Effects		
Methemoglobinemia (<i>core</i>)	1) Case of methemoglobinemia (<i>core</i>)	States or local jurisdictions: health agencies
Outbreaks attributed to drinking water (<i>core</i>)	1) Number by type of water supply (including bottled water) and etiologic agent (biologic, toxic, other) (<i>core</i>)	CDC States or local jurisdictions: health agencies
Interventions		
Implementation of sanitary surveys (<i>core</i>)	1) Number and proportion of drinking water systems in which a sanitary survey has been conducted within past 5 years (by type of water supply) (<i>core</i>)	EPA: SIDWIS USGS: sewage tracer program
Compliance with operation and maintenance standards (<i>core</i>)	1) Fines for noncompliance with SDA regulations or local guidelines (<i>core</i>) 2) Citations for noncompliance with local water quality regulations or guidelines (<i>core</i>)	AWWA EPA States or local jurisdictions: health agencies; public water utilities
Boil-water advisories (<i>core</i>)	1) Number of boil water advisories by type of water supply (<i>core</i>)	States or local jurisdictions: health agencies; public water utilities
Source water protection programs (<i>optional</i>)	1) Proportion of wellheads covered by protection programs (<i>optional</i>) 2) Proportion of surface water supplies covered by watershed protection programs (<i>optional</i>)	AWWA EPA States or local jurisdictions: health agencies; public water utilities
Public education (<i>optional</i>)	1) Proportion of the population aware of availability and meaning of consumer confidence reports (<i>optional</i>)	States or local jurisdictions: health agencies; public water utilities